

CLAIMS

1. An electron transmissive window, comprising:
a substrate having a window aperture formed therethrough;
a grid comprising a first material formed of ribs overlying said window aperture; and
5 a window layer comprising a second material having a thickness of between 1 and 5nm
supported on said ribs, extending therebetween, and exposed on a first side to said window
aperture and on a second side opposite said window aperture.

2. The window of Claim 1, wherein said thickness is between 2 and 3 nm.

3. The window of Claim 1, wherein said grid is formed of a support layer having a
10 thickness of between 0.4 and 5 μ m.

4. The window of Claim 1, wherein window layer contacts said substrate in an area
away from said window aperture and said a support layer of which is grid is formed contacts
said window layer.

5. The window of Claim 1, wherein said grid is exposed to said window aperture.

15 6. The window of Claim 5, wherein said window layer is coated onto sidewalls of said
ribs and sides of said ribs opposite said aperture.

7. The window of Claim 5, wherein said grid is formed of a support layer contacting
said substrate in an area away from said window aperture.

20 8. The window of Claim 1, wherein said first and second materials are chosen from the
group consisting of silicon oxide and silicon nitride.

9. The window of Claim 8, wherein said first and second materials are a same material.

10. The window of Claim 8, wherein said first and second materials are different materials.

11. The window of Claim 1, wherein said substrate is a silicon substrate.

5 12. In an electron analysis system comprising a source of probing radiation for exciting a sample and an electron analyzer disposed within a vacuum chamber held at a pressure of no more than 10^{-6} Torr, said sample being disposed outside of said vacuum chamber, a window sealable to said chamber between said sample and said electron analyzer and comprising:

 a substrate having a window aperture formed therethrough;

10 a grid comprising a first material formed of ribs overlying said window aperture and supported in an area of said substrate away from said window aperture; and

 a window layer comprising a second material having a thickness of between 1 and 5nm supported on said ribs, extending therebetween, and exposed on a first side to said window aperture and on a second side opposite said window aperture.

15 13. The window of Claim 12, wherein said first and second materials are selected from the group consisting of silicon oxide and silicon nitride.

 14. The window of Claim 13, wherein said first and second materials are a same material.

 15. The window of Claim 12, wherein said thickness is between 2 and 3nm.

20 16. An electron analysis system, comprising:

 a source of probing radiation for exciting a sample to produce electrons;

 a vacuum chamber having an interior maintained at a pressure of no more than 10^{-6}

Torr;

an electron analyzer disposed in said interior of said chamber;

a sample holding position disposed at a position vacuum isolated from said interior of said chamber; and

5 an electron transmissive window sealed to said chamber between said interior and said sample holding position and comprising

a substrate having a window aperture formed therethrough,

a grid comprising a first material formed of ribs overlying said window aperture,

and

10 a window layer comprising a second material having a thickness of between 1 and 5nm supported on said ribs, extending therebetween, supported in an area of said substrate away from said window aperture, and exposed on a first side to said window aperture and on a second side opposite said window aperture.

15 17. The system of Claim 16, wherein said source of probing radiation is a source of x-rays.

18. The system of Claim 17, wherein said source is disposed on a side of said window opposite said interior of said chamber.

20 19. The system of Claim 16, wherein said source of probing radiation is a source of probe electrons disposed in said interior of said chamber and irradiating said probe electrons through said window.

20. The system of Claim 16, wherein said substrate is a silicon substrate and said first and second materials are selected from the group consisting of silicon oxide and silicon nitride.